

The Office Action dated June 25, 2001 and the cited references have been carefully considered.

Claims 1-17 and 33-52 are pending. Claims 1-3, 5-6, 13, 33-35, 37-38, 45, and 50-52 are rejected under 35 U.S.C. § 103(a) as being obvious over McGill et al. (U.S. Patent 5,880,552; hereinafter "McGill") in view of Litwin et al. (U.S. Patent 6,056,805; hereinafter "Litwin"). The Applicants respectfully traverse this rejection for the reasons set forth below. Claims 4, 7-12, 14-17, 36, 39-44, and 46-49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Applicants respectfully wish to point out that claim 12 is already an independent claim. Therefore, claim 12 should be allowable.

The Applicants wish to thank the Examiner for indicating that claims 4, 7-11, 14-17, 36, 39-44, and 46-49 would be allowable if rewritten in independent form. Claim 4 has been amended to become an independent claim and now includes all of the limitations of base claim 1. Claims 7, 9-10, and 14-17 have been amended to depend from claim 4. Claims 7-11 and 14-17 now depend from claim 4, directly or indirectly, and now overcome the Examiner's objection. Similarly, claim 36 has been amended to become an independent claim and now includes all of the limitations of base claim 33. Claims 39, 41, 43-44, and 47-49 have been amended to depend from claim 36. Claims 39-44 and 46-49 now depend from claim 36, directly or indirectly, and now overcome the Examiner's objection. Therefore, claims 4, 7-12, 14-17, 36, 39-44, and 46-49 are now allowable. Early allowance is respectfully requested.

Claim Rejection Under 35 U.S.C. § 103(a)

Claims 1-3, 5-6, 13, 33-35, 37-38, and 45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over McGill in view of Litwin. The Applicants respectfully traverse this rejection because McGill's teaching is in conflict with Litwin and, thus, cannot be properly combined with Litwin.

"[T]he legal conclusion of obviousness requires that there be some suggestion, motivation, or teaching in the prior art whereby a person of ordinary skill would have selected the components that the inventor selected and used them to make the new device." *C.R. Bard, Inc. v. M3 Systems, Inc.*, 48 U.S.P.Q.2d 1225, 1231-32 (Fed. Cir. 1998). Thus, if one reference teaches away from the teaching of another reference, it is not proper to combine the references. Moreover, doing what those skilled in the art suggested should not be done is strongly probative of nonobviousness. *Kloster Speedsteel AB v. Crucible, Inc.*, 230 U.S.P.Q. 81, 86 (Fed. Cir. 1986).

McGill discloses a chemical or biochemical sensor transducer provided with a protective coating of diamond or diamond-like carbon between the transducer and a chemoselective or bioselective layer on top of the protective coating. McGill particularly teaches away from disposing a non-polar chemoselective layer directly on the transducer, specifically a quartz waveguide, because this configuration resulted in a loss of sensor response. McGill, column 5, lines 26-38. Litwin, however, discloses only non-polar organic polymers used as absorbents for non-polar organic molecules. Litwin, column 3, lines 27-35. Thus, McGill's teaching would discourage not only using Litwin's non-polar polymers on his device but also putting such polymers directly on his device. Therefore, it is not proper to assert that Litwin's non-polar polymers may be substituted for McGill's polymer and may be disposed directly on McGill's sensor to arrive at the sensor recited in claims 1-3, 5-6, 13, 33-35, 37-38, and 45 because (1) McGill teaches away from using a non-polar layer and (2) McGill teaches away from putting the non-polar layer directly on his sensor. Although Litwin discloses several polymers used as absorbents for non-polar organics, the cited prior art considered as a whole does not provide a

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motivation to combine Litwin's non-polar polymers directly on McGill's sensor for the reasons set forth immediately above.

In contradistinction, the chemical sensor recited in claims 1-3, 5-6, 13, 33-35, 37-38, 45, and 50-52 has a polymeric film comprising hard and soft domains, which film is disposed directly on the sensor element (i.e., the sensor does not have an intervening diamond or diamond-like layer). Thus, McGill teaches away from this general configuration of the chemical sensor and method of the present invention, as recited in claims 1-3, 5-6, 13, 33-35, 37-38, and 45. Therefore, McGill cannot be properly combined with any other reference to render obvious claims 1-3, 5-6, 13, 33-35, 37-38, and 45.

The invention as whole, with all of its limitations, must be taught or suggested by the prior art. Here, the cited prior-art references cannot be reconciled because of their contradictory teachings to arrive at the claimed invention as recited in claims 1-3, 5-6, 13, 33-35, 37-38, and 45. Therefore, the cited references cannot render obvious these claims.

Response to the Examiner's Argument

The Examiner stated that "there is nothing in the Specification that would indicate that an intervening layer is expressly excluded." The Applicants respectfully disagree because the Specification is clear that the polymer layer of the present invention is disposed directly on the sensing element. The present Specification states:

"The polymeric film is disposed as a polymeric film coating on a surface of a sensor's piezoelectric crystal. . ."

Specification, page 6, lines 5-7, emphasis added.

Specification is read from the vantage of a person of ordinary skill in the art. 35 U.S.C. § 112. A polymeric film disposed on a surface of a crystal is not a polymeric film disposed on a protective layer formed on the crystal, as a person of ordinary skill in the art understands. The present Specification discloses that the polymeric film coating is disposed on a surface of the sensor's piezoelectric crystal (the sensing element). McGill's diamond-like carbon intervening layer is not a "piezoelectric crystal." Therefore, McGill does not disclose the polymeric film coating on the surface of the sensing element of claims 1-3, 5-6, 13, 33-35, 37-38, and 45.

The Examiner stated that "the Specification provides absolutely no working examples that describe the construction of such a sensor device." The Applicants respectfully disagree. Figures 1-16 show the measured responses of working QCM sensors coated with various polymer films when exposed to toluene or TCE (See, the Brief-Description-of-the-Drawings section). The Specification states that

"The polymeric film is disposed as a polymeric film coating on a surface of a sensor's piezoelectric crystal, and can be applied by accepted coating techniques."

Specification, page 6, lines 5-7.

The Examiner's complaint that there is "no working examples that describe the construction of such a sensor device" is not legitimately founded. "The specification need not contain an example if the invention is otherwise disclosed in such a manner that one skilled in the art will be able to practice it without an undue amount of experimentation." M.P.E.P. § 2164.02 (Feb. 2000) (quoting *In re Borkowski*, 164 U.S.P.Q. 642, 645 (C.C.P.A. 1970)).

The present specification does disclose that the polymer film may be applied on the sensing device by accepted coating techniques. These techniques are known by people skilled in the art of applying polymer thin films on a solid substrate.

Such techniques include, but are not limited to, for example, painting, ink-jet printing, spray coating, dip coating, spin coating, and chemical vapor deposition followed by polymerization. Thus, disposing a polymer film on a sensing element using accepted techniques does not require undue experimentation. Therefore, the specification adequately informs persons skilled in the art on the construction of a sensing element coated with a polymer film, and no explicit detailed teaching of the construction of the polymer-coated sensing element is necessary.

In view of the above, it is submitted that the claims are patentable and in condition for allowance. Reconsideration of the rejection is requested. Allowance of claims at an early date is solicited.

Respectfully submitted,

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